# *The great cookie bake*

| **Primary: (ages 7 – 11)** | **Mathematics** |
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**Children in groups are challenged to solve mathematical operations in order to collect sufficient money to purchase the ingredients for cookies from the classroom-shop. Then they measure the ingredients together and use the appropriate amount to bake the cookies. Through this game, they practice written addition, subtraction, and weighing. In addition to mathematical practice, children also learn skills which are useful in their everyday lives, such as dealing with money and the responsibility attached to it.**

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| **Time allocation** | 2 lesson periods |
| **Subject content** | Units of measurement, weighing<br>Basic calculation skills: addition and subtraction<br>Technical and household skills and dealing with money |
| **Creative and critical thinking** | This unit has a **creativity** focus:<br>• Generate and play with several approaches and envision how to solve a maths problem<br>• Make connections between maths concepts and between mathematics and real life<br>• Reflect on steps taken to pose and solve a maths problem |
| **Other skills** | Collaboration |
| **Key words** | money; shop; ingredients; measuring; addition; subtraction; ratios |

**Products and processes to assess**

Children work collaboratively to generate ways to solve a variety of maths problems in order to exchange ideas and correct answers for money to buy ingredients for a cookie. At the highest levels of achievement, they succeed in this task by offering a good number of correct answers and appropriate ideas. Their work process demonstrates openness to the ideas of others and a willingness to explore ideas and see connections with other domains.

## Teaching and Learning plan

This plan suggests potential steps for implementing the activity. Teachers can introduce as many modifications as they see fit to adapt the activity to their teaching context.

| Step | Duration | Teacher and student roles | Subject content | Creativity and critical thinking |
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| **1** | Lesson period 1 | Teacher introduces the exercise by giving each group (of around 5 students) one recipe and one pricelist and explaining that students need to collect enough money to buy the ingredients described in the recipe. The students work with real money.<br><br>They need to calculate how much money they need by comparing the recipe and the pricelist. Then they work together to complete mathematical exercises in order to earn the money they need. The exercises are connected to the current curriculum. There are 3-5 operations on one exercise sheet and the number of operations determines the value of the sheet. The groups can redeem their solved sheets for money to use in the store. In this way they "work" for their money and collect enough to buy the ingredients, just like in real life.<br><br>As an alternative or additionally, students could also be asked to generate a number of different ideas in order to earn their money. For example, they can be asked to think of three different ways to measure ingredients if they did not have a scale or to think of three questions they have about mathematics or three ways mathematics is used in everyday life etc.<br><br>Teacher's role: Checking the exercises, allocation of money. | Calculating how much money is needed to buy ingredients<br><br>Written addition and subtraction<br><br>Managing money | Generating and playing with several approaches to solve a maths problem<br><br>Making connections between money, measurements, recipes, maths, and real life |
| **2** | Lesson periods 1 and 2 | Children continue to work in the same group. They begin by using their collected money to buy the ingredients for the cookie. The prepared packets do not contain the exact quantity needed of ingredients; therefore, students must look at the prices and work out how many packets they should purchase to have the required amount for the recipe. (We work with recipes that do not need baking). They will need to work together in their groups to come up with the best way to make these calculations.<br><br>"Baking" the cookie: After they have bought all the ingredients, they need to measure the necessary quantities for the recipe. Then they can start to prepare the dough, and roll small balls out of it. This is how the delicious cookies are made (e.g. banana or chocolate cookies) from their own earned money and through learning. The teacher may also decide to take this opportunity to discuss simple ratios as appropriate.<br><br>Teacher's role: shopkeeper, who serves the goods. There can also be one student | Calculating how many packets are needed for a recipe<br><br>Using money<br><br>Measuring ingredients<br><br>Checking measurements | Envisioning how to solve a meaningful maths problem<br><br>Considering several perspectives on approaching a maths problem |

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| | | supervisor, who checks the measured amounts. | |
| **3** | Lesson period 2 | The groups can share their cookies – if they want to.<br><br>The teacher may decide to close the activity with a discussion of what students did, what they have learned about mathematics and how it is used in everyday life and by asking students to brainstorm additional examples of mathematics in everyday life. | Reflecting on steps taken to pose and solve a maths problem<br><br>Generating ideas for how maths is connected to everyday life |

## Resources and examples for inspiration

**Web and print**

- Printed pricelist for the shop
- Printed recipes for the cookies (it is easier to use ‘no bake’ cookies)

**Other**

- Paper, pen, pre-measured packets of cookie ingredients, scale, bowls and other kitchen tools
- Prepared exercise sheets
- A “shop” set up in the classroom

| Creativity and critical thinking rubric for mathematics | •Mapping of the different steps of the lesson plan against the OECD rubric to identify the creative and/or critical thinking skills the different parts of the lesson aim to develop |
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| | CREATIVITY<br><br>Coming up with new ideas and solutions | Steps | CRITICAL THINKING<br><br>Questioning and evaluating ideas and solutions | Steps |
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| **INQUIRING** | Make connections to other maths concepts or to ideas from other disciplines | 1,2 | Identify and question assumptions and generally accepted ways to pose or solve a maths problem | |
| **IMAGINING** | Generate and play with several approaches to pose or solve a maths problem | 1,2,3 | Consider several perspectives on approaching a maths problem | 2 |
| **DOING** | Pose and envision how to solve meaningfully a maths problem in a personally novel way | 1,2 | Explain both strengths and limitations of different ways of posing or solving a math problem based on logical and possibly other criteria | |
| **REFLECTING** | Reflect on steps taken to pose and solve a maths problem | 3 | Reflect on the chosen maths approach and solution relative to possible alternatives | |